ington, are given and his deductions are most interesting.

Shortly after reading this article the undersigned came across an old book, printed in London in 1859. This book's title is "Ten Thousand Wonderful Things, Marvelous, Rare, Curious and Quaint." It was compiled by Edmund Fullington King, and is made up of short articles of historic, scientific and otherwise curious phenomena. On page 189 of this book appears the following account of what is described as "An extraordinary problem" with reference to the changing characteristics observed in gallinaceous birds. The article follows:

A CHANGE IN SEX

Connected with the plumage of birds is an extraordinary problem which has baffled all research, and toward the solution of which not the slightest approach has been made. Among certain of the gallinaceous birds, and it has been observed in no other family, the females occasionally assume the male plumage. Among pheasants in a wild state the hen, thus metamorphosed, assumes with the livery a disposition to war with her own race, but in confinement she is spurned and buffeted by the rest. From what took place in a hen pheasant in the possession of a lady friend of the late Sir Joseph Banks, it would seem probable that this change arises through some alteration in the temperament at a late period in the animal's life. This lady paid particular attention to the breeding of pheasants. One of the hens, after having produced several broods, moulted and the succeeding feathers were exactly those of a cock. The animal never afterward laid an egg.

The pea hen has sometimes been known to take the plumage of the cock bird. Lady Tynte had a favorite pea hen which at eight several times produced chicks. Having moulted when about eleven years old, the lady and her family were astonished by her displaying the feathers peculiar to the other sex and appearing like a pied peacock. In this process, the tail, which was like that of the cock, first appeared. In the following year she moulted again and produced similar feathers. In the third year she did the same, and then also spurs resembling those of the cock. The bird never laid after this change of her plumage.

This paragraph in this old book, printed seventy years ago, only goes to prove that there is "nothing new under the sun," although those who observed the phenomena at that day were unable to account for it to the extent that Dr. Riddle has.

I. M. HEMINGER

SAN JOSE, CALIF.

ANTI-EVOLUTION PROPAGANDA IN GEORGIA

THE following extract from the letter of a friend teaching in Georgia, one whose name carries a Ph.D. degree from the University of Wisconsin and whose reputation for veracity is excellent, may help to explain why the people of Georgia failed to support the recent anti-evolution bill brought before their legislature.

My friend with a perhaps improper curiosity had attended a negro church service during the month of July. I now quote:

> The preacher spoke somewhat as follows: "As long as they said us coluhd folks was descended from ape-like animals nobody didn't say nothing. But that's because their hearts wasn't pure. And when Darwin came along and said folks in gen'l was descended from a fossil, then nobody didn't like it. But his heart wasn't pure. And then Voltaire came along and said it too, but nobody didn't pay no attention to him because his heart wasn't pure. And then Thomas Payne came and said we was all descended from fossils. But he didn't make no headway, cause *his* heart wasn't pure. And in Tennessee, Bryan and Darrow and those folks won't do no hurt, for their hearts isn't pure. The Bible don't say we's descended from fossils."

JOHN SMITH DEXTER

UNIVERSITY OF PORTO RICO

SCIENTIFIC BOOKS

Dynamische Meteorologie. By F. M. EXNER, professor of geophysics at the University of Vienna and director of the Central Institute for Meteorology and Geodynamics. 2d Edition, much enlarged. 421 pages, with 104 figures in the text. Vienna, 1925, Julius Springer.

ANY contribution from so careful and conscientious an investigator as Exner is worth having, and the present volume should be in the hands of every serious student of what formerly was called dynamic meteorology; but is now more generally termed aerography—the structure of the atmosphere.

The book first appeared in 1916 and evidently suffered from the loss of touch with British and American progress. The war certainly did advance our knowledge of air structure, even if we consider only the instrumental side of the problem. In one of his papers before the Royal Meteorological Society (April, 1919), Sir Napier Shaw said:

> It may be that in the near future no meteorological observatory will be regarded as really complete if it does not possess a cinematograph camera, a searchlight, a range finder and a chronograph, besides a kite balloon, a gun and ammunition, and crews to use them.

There is a decided flavor of war-time experience in the above; and in time of peace we can dispense with some of these; but on the other hand there are new

instruments, particularly those connected with vapor, dust, cloud and visibility problems, which are now essential. Also every observatory should have its own airplane, or better yet a fleet of planes, and be in close touch with the travelers of the air.

Exner has included in this present edition all recent discussions on mass movements of warm and cold air streams, the various theories regarding the origin of cyclones and the behavior of air masses when in juxtaposition with sharply marked boundaries. The results of such interchange can be traced in causing or facilitating precipitation.

The latest views of the Bergen school of forecasters and the function of surfaces of discontinuity—the so-called polar front and the steering line (Böenlinie und Kurstlinie)—are given at length.

In the opening chapters on mass systems and the laws of gases, there is room for improvement and there is a departure from the C.G.S. system. While the author defines the accepted or Bjerkian bar with its thousandth part the millibar, he prefers to stick to the older unit, the pressure of a millimeter of Hg. And in a footnote regarding the distinction between mass and weight, there is a reversion to the meter-kilogram-second system. It is confusing to read about normal pressure in such units. In this respect the book is disappointing.

The opening chapters deal with the usual equations for unsaturated and saturated conditions. One is apt to get the impression that the weight of water vapor is five eighths that of dry air, forgetting that this value only holds under certain conditions of pressure and temperature. We notice also that the values of the specific heat for dry air $c_p = 0.2375$, at constant pressure and the same for constant volume $c_v = 0.1690$, are not recent values, namely, 0.2387 and 0.1701. The ratio is 1.40329. The old value which Exner uses is 1.405. In fact, the latest value is 1.402.

Succeeding chapters deal with the more general equations of dynamics and hydrodynamics, and unless one is quite conversant with spherical coordinates, there is here some hard reading.

Other chapters deal with vertical temperature distribution in the free air when at rest, which actually is seldom (if ever) the case, convection, the solar constant of radiation, the troposphere and stratosphere. The fifth chapter deals with the kinematics of moving air streams, and while the two volumes of Bjerknes are referred to, the author prefers an older treatment as being more concise and in better accord with the trend of his own memoirs; and also lending itself more readily to graphic representation. The trajectories of air flow, with points of convergence and divergence over Austro-Hungary and the Adriatic are discussed with illustrations; also the occurrence and distribution of rain on mountain summits, in connection with the deformation of stream lines.

In the last half of the book different types of cyclones and anticyclones are discussed with relation to modern theories. Thus we have the Bjerknes scheme of families of cyclones, as a series of waves or rather eddies along a polar front.

The book is a mine of information for serious readers and those who have time and care to work out the problems. In many respects it may be compared with Richardson's unique volume, "Weather Prediction by Numerical Process"; and like that book will well repay study by forecasters. For the layman it is hard of comprehension; but then let it be remembered that the vagaries of weather, that is, the complex resulting from the interplay of air streams of different pressures, temperatures, velocities and vapor content, is likewise hard to comprehend. Indeed, it is almost bewildering; and the wonder is that anticipations are fulfilled and forecasts verified as frequently as they are.

ALEXANDER MCADIE

BLUE HILL OBSERVATORY

SCIENTIFIC APPARATUS AND LABORATORY METHODS

CONDITIONS OF VALIDITY OF MACALLUM'S MICROCHEMICAL TEST FOR CALCIUM[1]

ACCORDING to A. B. Macallum (*Ergeb. d. Physiol.*, 1908, 7, 611), purpurin forms a reddish purple compound in place with calcium, and so may be used to determine the localization of calcium in plant and animal cells. The fact that purpurin is an indicator for alkalies makes it desirable to determine the reliability of this test.

To ensure the purity of solutions to be employed in this investigation the water was glass distilled and analyzed reagents used throughout. One series of experiments was made with pure solutions; and a second series with Paramoecium caudatum transferred from such solutions in which they live for days.

Neutral and slightly acid solutions of purpurin are orange, and alkaline solutions are reddish purple in color. Aqueous solutions of purpurin were added to M/24 solutions of sodium, potassium and calcium chloride and saccharose. All solutions were colored orange and in the calcium chloride solution only a heavy orange precipitate appeared.

[1] Contributions from the Department of Zoology, Smith College, No. 134.